

SN 09/530,815
Art Unit 1713

DISCUSSION

The claims have been amended to more particularly point out and clearly define what applicant consider to be their invention. The claims have been amended to overcome the rejections under 35 U.S.C. 112 and to more particularly define the parameters of the composition of the present invention.

Applicants respectfully submit that the amendments to the claims are fully supported in the specification and claims as originally filed. No new matter has been entered by way of amendment to the claims.

The claims have been amended to delete the term "residues" from the claims. The term "residues" has been replaced by the term "constitutional units provided by" the component monomer. This is consistent with the nomenclature utilized in Encyclopedia of Polymer Science and Engineering, Second Ed. Vol. 10 at page 25. A copy of page 25 is enclosed for the Examiner's consideration. It is Appellant's opinion that the term "units" would not be proper since the copolymer does not contain acrylate units and acrylonitrile units. The acrylates and the acrylonitriles have been polymerized and the acrylate and acrylonitrile do not exist in the copolymer. Applicants respectfully submit that the replacement of the term "residues" with the term "constitutional units provided by" overcomes the rejection under 35 U.S.C. 112 over the use of the term "residue".

Applicants respectfully request that the Examiner reconsider the rejection of claim 17 over the use of the term "molecular or weight" without denoting whether the molecular weight is a number average or weight average molecular weight. Applicants respectfully submit that the low molecular weight of between 300 and 1500 clearly refers to oligomers. As is well known in the art, oligomers are (co)polymers which contain only a limited number of constitutional units. Generally oligomers contain up to about 14 constitutional units. In the range of the low molecular weight, the weight average and number average molecular weights are very similar or substantially the same. Applicants therefore respectfully submit that in view of the low molecular weight of the oligomers, the term "molecular weight" is not indefinite. Applicants respectfully

SN 09/530,815
Art Unit 1713

request reconsideration and withdrawal of the rejection.

Claim 21 has been amended to utilize the language suggested by the Examiner. Applicants therefore respectfully request that the objection be reconsidered and withdrawn.

Before discussing the rejections over the prior art, Applicants deem it prudent to set forth what they consider to be their invention. Applicant's invention comprises a mixture containing a copolymer containing from 85% to 98% by weight of constitutional units provided by at least one acrylate and from 2% to 10% by weight of constitutional units provided by acrylonitrile wherein the acrylate is an ester of acrylic acid with an alcohol containing 2 to 8 carbon atoms and from 0.2% to 15% by weight of at least one fatty compound as a plasticizer; 5 to 20% by weight of water; up to 70% by weight of filler and pigments; and 0.3 to 5% by weight of auxiliaries.

The invention is based on the discovery that small additions of a fatty compound plasticizer to the particular acrylate/acrylonitrile polymer has a dramatic effect upon the rubber-like properties of the composition. That is, the elasticity and the adhesion properties of the composition are substantially improved. It is unexpected that the small addition of the fatty compound plasticizer would substantially increase the elastic properties of the composition. Applicants respectfully submit that the present invention is neither taught or suggested by the prior art references cited by the Examiner.

Claims 6-26 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103 (a) as obvious over D'Alelio (US 2,442,588), Antlfinger et al. (US 3,486,930), Reinhard et al. (US 3,551,374), Fukuda et al. (US 3, 706,589), Patella (US 3,736,287), Reed (US 3,738,991) or Patella (US 3,749,690). Applicants respectfully submit that D'Alelio, Antlfinger et al., Reinhard et al, Fukuda et al., Patella '287, Reed, and Patella '690 whether considered alone or in combination neither teach nor suggest the present invention.

D'Alelio discloses a copolymer comprising constitutional units provided by an acrylate ester, acrylonitrile and a diene-1,3. As stated at col. 3, lines 33-47, the

SN 09/530,815
Art Unit 1713

polymer useful in the D'Alelio composition comprises 25-65% by weight of constitutional units provided by acrylonitrile, 65-25% by weight of constitutional units provided by acrylic acid ester and 1.75-30% by weight of 1,3 dienes. A preferred range is from 25-40% by weight of constitutional units provided by acrylonitrile, 40-55% by weight of constitutional units provided by acrylic acid ester and 15-25% by weight diene 1,3.

Applicants respectfully submit that the D'Alelio would neither teach nor suggest utilizing a polymer comprising from 85 to 98% by weight of constitutional units provided by at least one acrylate and from 2 to 10% by weight of constitutional units provided by acrylonitrile.

Antfingher et al. disclose an interpolymer containing at least 25% by weight of constitutional units provided by vinyl halide. The interpolymer can contain constitutional units provided by acrylonitrile and acrylic esters. However, when the minimum amount of constitutional units provided by vinyl halide is 25% by weight of the polymer, it is not possible to provide a polymer containing from 85% to 98% by weight of constitutional units provided by at least one acrylate and from 2 to 10% by weight by constitutional units provided by acrylonitrile. Applicants respectfully submit that there is neither teaching nor suggestion in Antfingher et al. to modify their polymer by eliminating the vinyl halide to provide a polymer useful in the practice of the present invention.

Applicants respectfully submit that in view of the differences in the polymer useful in Antfingher et al. and the polymer useful in the practice of the present invention, Applicants respectfully submit that a rejection under 35 U.S.C. 102 is improper. In addition, Applicants respectfully submit that there is neither teaching nor suggestion in Antfingher et al. to provide a polymer containing from 85 to 98% by weight of constitutional units provided by at least one acrylate. In addition, there is neither teaching nor suggestion to select acrylonitrile as a comonomer to utilize with the acrylate monomers. Applicants respectfully submit that a rejection under 35 U.S.C. 102 or 103 over Antfingher et al. is untenable and respectfully request that the rejection be reconsidered and withdrawn.

SN 09/530,815
Art Unit 1713

Reinhard et al. disclose a caulking and sealing compound which comprises a mixture of a polymer A which can comprise acrylates and acrylonitrile with a polymer B having a K value of 10 to 70 and preferably 30 to 50. The specification at col. 4, lines 33-35 indicates that plasticizers, drying oils, stabilizers and emulsifiers may be added in the usual way both in the polymer B and to the polymer mixtures. However, the specification does not teach nor suggest the particular class of plasticizer useful in the practice of the present invention, nor the amounts which should be added to the composition. None of the examples in the application contain a plasticizer as set forth in the present application.

Applicants submit that a plasticizer would not be necessary in the Reinhard et al. composition since the polymer B appears to act as a plasticizer in view of the high elongation of the material as shown in the examples. As set forth in the present application, the fatty compound plasticizers are utilized to improve the elongation of the composition. The results obtained by utilizing only small amounts of the fatty compound plasticizers is unexpected in view of the teachings of Reinhard et al. Applicants respectfully request that the rejection under 35 U.S.C. 102 or 35 U.S.C. 103 over Reinhard et al. be reconsidered and withdrawn.

Fukuda et al. disclose a surface protective composition consisting essentially of a mixture of an inorganic and organic powder in a dispersed-binder wax and/or synthetic resin emulsions with water serving as the main solvent. The specification at col. 3, lines 54 and 55 indicates that acrylate copolymers and acrylonitrile/acrylate copolymers may be utilized as the synthetic resin emulsion. However, there is neither teaching nor suggestion that the copolymers contain from 85 to 98% by weight of constitutional units provided by at least one acrylate and from 2 to 10% by weight of constitutional units provided by acrylonitrile.

The composition disclosed in Fukuda et al. does not include a plasticizer. In addition, since the composition of Fukuda et al. must be sprayable, the amount of solvent/water in the composition must be sufficiently great to provide a low viscosity

SN 09/530,815
Art Unit 1713

material. As shown in the examples the amount of water or solvent in the composition is generally at least 50% by weight and generally 75% by weight of water or solvent (see examples 11, 12 and 13).

Applicants respectfully submit that there is no teaching or suggestion in Fukuda et al. to utilize an emulsion of the particular polymer useful in the practice of the present invention, to add a plasticizer and in addition to reduce the amount of water in the composition to a range of 20% or less. Reducing the amount of solvent or water in the composition to the range of 20% to form a paste would make the composition of Fukuda et al. completely useless for the intended purpose. That is, it would not be possible to spray a light coating of the composition over an extended surface to provide a protective film.

In view of the use of the composition of Fukuda et al. to protect a painted surface, Applicants submit that the addition of the fatty compounds to the material would increase the difficulty in removing the surface coating and would tend to leave stains on the painted surface.

Applicants respectfully submit that a rejection based on Fukuda et al. under 35 U.S.C. 102 or 35 U.S.C. 103 is untenable and respectfully request that the rejection be reconsidered and withdrawn.

Patella '287 is directed to an aqueous acrylic interpolymer emulsion and its use thereof in latex paints. However, the composition of Patella '287 would neither teach nor suggest the present invention.

Patella discloses an acrylic emulsion of a pentapolymer containing from 5 to 30% by weight of constitutional units provided by acrylonitrile and from 20 to about 70% by weight of the constitutional units provided by an alkyl acrylate or mixtures thereof. Applicants submit that this polymer composition is far outside of the range of 85 to 98% by weight of constitutional units provided by acrylates and from 2 to 10% by weight of constitutional units provided by acrylonitrile. Applicants submit that there is no teaching or suggestion to modify the polymer useful in the Patella latex by increasing the amount

SN 09/530,815
Art Unit 1713

of acrylate useful in the composition.

In addition, the composition disclosed in Patella '287 does not contain a plasticizer. Applicants submit in view of the good burnish resistance, stain removal properties and scrub resistance of the composition, one skilled in the art would not be led to include a plasticizer in the composition which would tend to reduce the desirable properties of the composition by softening the resin.

In addition, the composition disclosed in Patella '287 contains substantial amounts of water since the material must be readily flowable to be applied to a surface as a paint. Applicants submit that there is neither teaching nor suggestion to provide a paste composition containing only 5 to 20% by weight of water. Such a low content of water would provide a material which was not useful as a paint. Applicants therefore respectfully submit that Patella '287 neither teaches nor suggests the present invention. Applicants respectfully request that the rejection be reconsidered and withdrawn.

Reed discloses a composition with enhanced adhesion which comprises an acrylic latex having incorporated therein a solid amide copolymer of ethylene and acrylic acid. The composition shows improved adhesive characteristics. The latex may be employed in the manufacture of paints, sealants, caulks and mastics.

The specification teaches that the acrylate latex can be a copolymer of an acrylate and acrylonitrile. However, the proportions of the acrylate and the acrylonitrile are not specified except that the copolymer contains at least 60 weight % of constitutional units provided by alkyl acrylates and 40 weight % of other comonomer components. The latex composition must contain a second polymer of ethylene and acrylic acid. In addition, the composition can contain plasticizers, fillers and water. An example is provided utilizing a latex noted as copolymer latex C which contains 56% by weight of constitutional units provided by ethyl acrylate and 25% by weight of constitutional units provided by acrylonitrile and additional materials such as about 6% by weight of N-methylolacrylamide constitutional units and about 13% by weight of constitutional units provided by acrylic acid. Mixtures are shown which contain

SN 09/530,815
Art Unit 1713

plasticizers and the compositions disclosed in table 4 contain about 20% by weight of the acrylate polymer, 13% by weight of water and 4 to 5% by weight of plasticizer.

Reed fails as a reference under 35 U.S.C. 102 and 35 U.S.C. 103 since it neither teaches nor suggests the acrylate/acrylonitrile polymer useful in the practice of the present invention. Applicants submit there is neither teaching nor suggestion to formulate a polymer containing from 85 to 98% by weight of constitutional units provided by at least one acrylate and from 2 to 10% by weight of constitutional units provided by acrylonitrile. Applicants respectfully submit that there is neither teaching nor suggestion to modify the composition as disclosed in Reed to utilize the polymer of the limited composition set forth in the claims of the present application.

In view of the amendments to the claims and the lack of any teachings or suggestion to utilize a polymer containing from 85 to 98% by weight of constitutional units provided by acrylates and 2 to 10% by weight of constitutional units provided by acrylonitrile, Applicants respectfully submit that a rejection over Reed under 35 U.S.C. 102 or 103 is untenable and respectfully request that the rejection be reconsidered and withdrawn.

Patella '690 is directed to an aqueous tetrapolymer emulsion derived from the interpolymerization of acrylonitrile, an alkyl acrylate and certain polycarboxylic acids and unsaturated amides. The emulsion is utilized as a paint composition. However, there is neither teaching nor suggestion that the composition contains a plasticizer.

Applicants respectfully submit that a plasticizer would not be useful in the Patella '690 composition since the plasticizer would soften the polymer and degrade the properties such as burnishing resistance and stain removal.

Example 1 of Patella '690 discloses a preemulsion of monomers which would appear to provide a polymer containing about 11% by weight of constitutional units provided by acrylonitrile and 86% by weight of constitutional units provided by ethyl acrylate. However, the latex contains about 40% by weight of water. To formulate the paint, the latex containing about 40% by weight of water is then mixed with additional

SN 09/530,815
Art Unit 1713

water and a number of ingredients set out in col. 10, lines 45-64. The latex ready for use contains about 34% by weight of water.

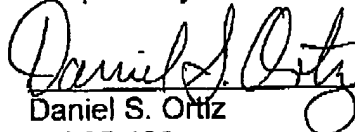
It is necessary that the composition contain substantial amounts of water since the paint latex must be spreadable in a thin layer with a brush roller or spraying apparatus. Clearly, the paste of the present invention would not be spreadable as a paint composition.

Applicants respectfully submit that there is neither teaching nor suggestion to reduce the amount of water in the paint latex of Patella '690 to form the viscous paste of the present invention. And in addition, introduce a plasticizer into the composition. Applicants respectfully submit that increasing the viscosity of the composition to form a paste and in addition softening the polymer by addition of a plasticizer would degrade the burnish resistance, stain removal and scrub resistance of the Patella '690 composition.

In view of the amendments entered in the claims and the above discussion, Applicants respectfully submit that a rejection of the claims over Patella '690 is untenable and respectfully request that the rejection be reconsidered and withdrawn.

Applicants respectfully submit that all of the references cited by the Examiner fail as a reference under 35 U.S.C. 102 or 35 U.S.C. 103 for the reasons set out above. Applicants respectfully submit that the amendments entered in the claims to overcome the rejections under 35 U.S.C. 112 and the above discussion place the application in condition for allowance. Favorable consideration is requested.

Respectfully submitted,



Daniel S. Ortiz

RN 25,123

Attorney for Applicant

610-278-4920

Henkel Corporation
Patent Law Department
2500 Renaissance Blvd.
Gulph Mills, PA 19406

RECEIVED

MAY 07 2003

GROUP 1720

ENCYCLOPEDIA OF POLYMER SCIENCE AND ENGINEERING

AL BOARD

MAN F. MARK
e of New York

T M. BIKALES
e Foundation

IVERBERGER
y f Michigan

ORG MENGES
IWTW Aachen

ecutiv Editor
CROSCWITZ

VOLUME 10

Molecular Weight Determination
to
Pentadiene Polymers

A WILEY-INTERSCIENCE PUBLICATION

John Wiley & Sons

NEW YORK • CHICHESTER • BRISBANE • TORONTO • SINGAPORE

V I. 10

V I. 10

MONOMER 25

76. R. S. Nevin and E. M. Pearce, *J. Polym. Sci. Part B* 3, 491 (1965).
 77. P. Sigwalt, *Chim. Ind. Milan* 98, 909 (1966).
 78. M. Morton, R. F. Kammerer, and L. J. Fetters, *Macromolecules* 4, 11 (1971); *Br. Polym. J.* 3, 120 (1971).
 79. J. Cornibert, R. H. Marchessault, A. E. Allegrezza, and R. W. Lenz, *Macromolecules* 6, 676 (1973).
 80. C. L. Lee, C. L. Frye, and O. K. Johansson, *Polym. Prepr. Am. Chem. Soc. Div. Polym. Chem.* 10, 1361 (1969).
 81. J. G. Zilliox, J. E. L. Roovers, and S. Bywater, *Macromolecules* 8, 573 (1975).
 82. P. M. Lefebvre, R. Jerome, and P. Teyssie, *Macromolecules* 10, 871 (1977).
 83. P. Dreyfuss and M. P. Dreyfuss, *Adv. Polym. Sci.* 4, 528 (1967).
 84. D. H. Richards, S. B. Kingston, and T. Souel, *Polymer* 19, 68 (1978).
 85. T. G. Crocher and R. E. Wetton, *Polymer* 17, 205 (1976).
 86. A. Hirao, K. Yamaguchi, K. Takana, K. Suzuki, S. Nakahama, and N. Yamazaki, *Makromol. Chem. Rapid Commun.* 3, 941 (1982).
 87. Z. Xu, J. Mays, X. Chen, N. Hadjichristidis, F. C. Schilling, H. E. Bair, D. S. Pearson, and L. J. Fetters, *Macromolecules* 18, 2560 (1985).
 88. R. Faust and J. P. Kennedy, *Polym. Bull.* 15, 317 (1986).

393 (1971).

(1983).

05 (1961).

1963).
 4533 (1964).
 John Wiley & Sons,

Macromolecules 7, 394

24 (1959).
 (1960).
J. Polym. Sci. Polym.

les 3, 777 (1970).

Melby, A. J. Playtis,

i).

1977).

Rev. 5, 126 (1966).
 the 5th International

16, 925 (1983).
 1963).

5 (1971).

3 (1984).
 d. 4, 3089 (1966).

72).

33).

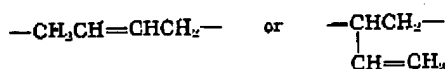
LEWIS J. FETTERS
 Exxon Research and Engineering Company

MONOMER


A monomer is defined as a compound consisting of molecules each of which can provide one or more constitutional units of a polymer (or oligomer) (1). For example, the monomer molecule styrene ($\text{C}_6\text{H}_5\text{CH}=\text{CH}_2$) provides the constituent unit $\text{—CH—CH}_2\text{—}$. The monomer molecule $\text{CH}_2=\text{CH—CH}=\text{CH}_2$ can



provide the constitutional units



The monomer molecule CH_2N_2 can provide the constitutional unit $\text{—CH}_2\text{—}$.

A monomer molecule of δ -valerolactone  can provide the con-

stitutional unit

